[This Drawing is a reproduction of the Original on a reduced scale.]

A.D. 1897, Sep. 24. N° 21,939.
TESKE'S Complete Specification.

FIG. 1.

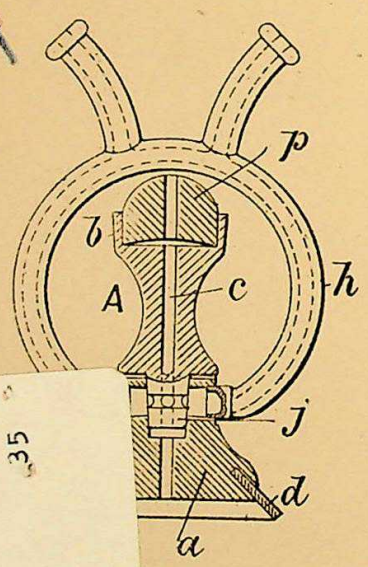


FIG. 2.

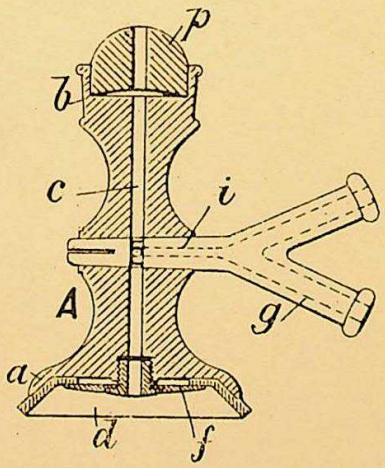
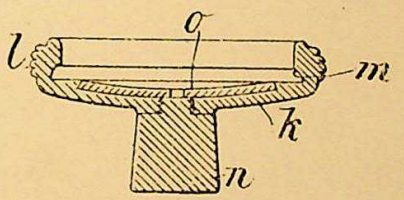


FIG. 3.



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N° 21,939 A.D. 1897

Date of Application, 24th Sept., 1897

Complete Specification Left, 24th June, 1898—Accepted, 13th Aug., 1898

DUPLICATE

PROVISIONAL SPECIFICATION.

Improvements in, and connected with, Stethoscopes.

I, CARL AUGUST TESKE, of 6, Moore Street, Cadogan Square, Chelsea, Surgical Instrument Maker, do hereby declare the nature of this invention to be as follows:—

My invention relates to improvements in stethoscopes and has for its principal object to improve the efficiency of the instrument and particularly to facilitate auscultation by causing the audible pulsations or murmurs of the heart and other thoracic organs to be much more energetically transmitted to the ear of the observer than by other instruments of the kind now in use.

With this object my improved stethoscope consists of a body portion which is made particularly heavy either by being composed of a solid mass of metal or by being made hollow and loaded with mercury or other heavy metal so that said body portion will by its inertia oppose such resistance to being set in motion by the pulsations to be auscultated as will cause the energy of those pulsations to be transmitted to the column of air which forms the medium of communication between the body of the patient and the ear of the observer.

In order to prevent as far as possible the absorption of those pulsations by a comparatively large volume of air, as in the bell mouth of an ordinary stethoscope, I make the body portion which is double ended, flat or but slightly concave at the ends and provide it with an encircling flange formed by a ring of indiarubber projecting slightly (a millimetre or two) from the end of the body portion so that when applied against a plane surface a thin film of air of large area but slight volume will be confined within the closed chamber thus formed at the mouth of the instrument and will form the medium whereby the pulsations are received and are propagated through the air passages leading to the ear tubes of the instrument, the indiarubber ring or flange being divergently coned by being sprung onto a divergently coned groove about the body portion so that it will readily adapt itself to inequalities of the surface to which it may be applied and be highly sensitive or respond to the slightest vibrations or movements.

The body portion is traversed by an axial passage of small bore and the one end of the body portion is made of small diameter to suit it for direct intercostal observation. When auscultating, the bore at the end which for the time being is not in use is closed by the finger of the observer and to enable either end to be brought into position for use the body portion is pivoted (like the pendant of a watch chain) between the ends of a tubular bow in communication by lateral passages in the body portion with the axial passage, and to which the flexible ear tubes are connected.

The body portion above described may be made in one piece or in two or more pieces screwed together for convenience in packing into a pocket case and in connection with the stethoscope as above described I provide a pocket tablet adapted to be used in conjunction with the stethoscope for purposes of ausculta-

[*Price* 8*d*.]

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tion in the following manner:—The tablets are composed of thin flexible leaves of celluloid, say three in number, pivoted together fanwise, one of the leaves having cemented to its face a thin ring of indiarubber of a diameter about corresponding to that of the larger end of the body portion of the stethoscope, this leaf being also perforated with a hole concentric with the ring. Upon this ring may be superposed one or other of the other leaves, one of which has a perforation to coincide with that of the first mentioned leaf whilst the other is imperforate so that between the two leaves a disc-like film of air is confined equal in thickness to that of the rubber ring. The one or other pair of superposed leaves is interposed between the stethoscope and the body of the patient and forms the plane surface against which the rubber flange of the body portion of the stethoscope is applied as previously mentioned.

For use in connection with the stethoscope there is also provided a pleximeter available for use as such and also as a plane surface for application to the large end of the body portion of the stethoscope to enable that end to be used for intercostal exploration. With this object it is provided with an undercut flange so as to form a cap fitting securely but loosely on the large end or mouth of the body portion of the stethoscope and is provided at its other side with a projection adapted to be pressed between the ribs of the patient during the auscultation.

Dated this 24th day of September 1897.

A. M. & WM. CLARK,
Chartered Patent Agents, 53, Chancery Lane, London.

COMPLETE SPECIFICATION.

Improvements in, and connected with, Stethoscopes.

I, Carl August Teske, of 6, Moore Street, Cadogan Square, Chelsea, Surgical Instrument Maker, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

My invention relates to stethoscopes and has for its principal object to improve the efficiency of the instrument and particularly to facilitate auscultation by causing the audible pulsations or murmurs of the heart and other thoracic organs to be much more clearly and energetically transmitted to the ear of the observer than by other instruments of the kind now in use.

The invention will be described with reference to the accompanying drawings forming part of this specification wherein Figure 1 shews a sectional elevation of one form of the body portion of the instrument. Figure 2 is a similar view of a modification. Figure 3 is a cross-sectional view of a pleximeter for use in connection therewith.

My improved stethoscope consists of a body portion A which is made of a solid mass of metal so that it will, by its inertia, oppose such resistance to the pulsations to be auscultated as will cause the energy of those pulsations to be transmitted to the column of air which forms the medium of communication between the body of the patient and the ear of the observer. The body portion is double-ended, the one end *a* being of large diameter and the other end *b* of small diameter, the body being traversed axially by an air passage *c* of small bore extending from end to end of the body portion.

In order to prevent, as far as possible, the absorption of the pulsations by a comparatively large volume of air, as in the bell mouth of an ordinary stetho-

scope, I make the large end *a* of the body portion flat or nearly so and provide it with an encircling flange formed by a ring of indiarubber *d* which projects slightly (a millimetre or two) from the end of the body portion so that when the edge of this ring is applied against a plane surface (such as a slip of celluloid or a visiting card for instance) a thin film of air of large area but slight volume will be confined within the closed chamber thus formed at the mouth of the instrument and will form the medium whereby the pulsations are received and are propagated through the passage *c* and the air passages in connection therewith leading to the ear tubes of the instrument. The indiarubber ring or flange is not perpendicular to the end of the body portion but is divergently coned by being sprung into a divergently coned peripheral groove *e* in the body, as in Figure 1, or by being clamped between a divergently coned flange on the body and the edge of a disc *f* screwed to the body, as in Figure 2, the effect of this divergent conical form being that the arris of the rubber will bear against the surface to which it may be applied and the elasticity of the rubber will be brought into play in such manner as to render the instrument highly sensitive to the slightest vibrations or movements of the surface with which it is in contact.

The opposite end of the body portion being made of small diameter is suited for direct intercostal observation, the one body portion thus forming a double stethoscope either end of which may be brought into operative position. When auscultating, the orifice of the bore *c* at the end which for the time being is not in use, is closed more or less by the finger of the observer, and to enable either end to be brought into position for use, the body portion is pivoted to turn on a tubular axis in one with the tubular Y-piece to which the usual flexible ear tubes are attached. In Figure 1 this axis is formed by the ends of a tubular bow *h* which are in communication with the axial passage *c* whilst in Figure 2 the pivot is formed by the tubular stem *i* of the Y-piece *g* the said stem being circumferentially grooved and transversely perforated so as to always maintain connection with the bore *c*.

The body portion may be made in one piece, as in Figure 2, or it may be made in two or more pieces separably fitted together for convenience in packing into a pocket case. Such a connection is shewn in Figure 1 where the one part has a plug *j* fitting in the other part, this plug being circumferentially grooved and transversely perforated where it comes opposite the lateral bores which communicate with the tubular bow *h* so that the latter will always be in communication with the bore *c*. In the case of the modification shewn in Figure 2, the end of the stem *i* is split and sprung into its seat in the body so as to ensure a friction-tight fit and be easily separable.

The smaller end *b* may be cupped, as shewn in Figures 1 and 2, and provided with a removable projecting head of rubber *p* to admit of the body of the stethoscope being used as a hammer in percussive observation, the rubber head being perforated to correspond with the bore *c*, and being removed when the small end *b* is used for auscultation.

For use in connection with the stethoscope there is also provided a pleximeter shewn in Figure 3, available for use as such, and also as a plane surface for application to the large end *a* of the body portion of the stethoscope so as to constitute therewith a stethonoscope and also to enable that end to be used for intercostal exploration. With the first mentioned object it is formed of a disc *k* (which may be of celluloid or other suitable material) provided with an upstanding peripheral flange *l* undercut as at *m* so as to form a cap adapted to loosely embrace the rubber ring *d* at the large end of the body portion of the stethoscope in such manner as to be easily applied or removed but not to fall off therefrom. It is provided at its other side with a projecting stem or stud *n* adapted to be pressed between the ribs of the patient, this stud being preferably of slightly divergent form and being screwed into a central through hole in the disc *k* of the pleximeter, so as when removed to leave a through aperture for the transmission of the pulsations, the disc then answering the purpose of the celluloid

slip or visiting card before referred to. The inner surface of the disc *k* may have an apertured lining of sheet rubber *o* as a pad to receive the blows made in the percussive method of observation.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A double-ended stethoscope having ends of different sizes as described and the body portion of which is massive or solid and is traversed by a passage of small bore, the said body portion being pivoted about a tubular axis in connection with the said passage and with the usual ear tubes as and for the purposes described.

2. A stethoscope having a massive body portion of large diameter at one end traversed by an air passage of small bore in communication with ear tubes, in combination with an encircling flange formed by a rubber ring of divergently coned form projecting slightly beyond the flattened end of the body portion so as to enclose an air space of large area but small volume, the rubber ring presenting an arris to contact with the surface against which it is to be applied substantially as and for the purpose specified.

3. The herein described improved forms of stethoscope substantially as described and shewn in the drawings.

4. The combination with a stethoscope such as described, having a divergently coned rubber flange as specified, of a pleximeter in the form of an apertured cupped disc having undercut flanges adapted to embrace the rubber flange of the stethoscope as described.

5. The combination with a stethoscope such as described, having a divergently coned rubber flange as specified, of a pleximeter in the form of a cupped disc having undercut flanges adapted to embrace the rubber flange of the stethoscope and provided with a projecting stud for intercostal observation as described.

Dated this 24th day of June 1898.

A. M. & WM. CLARK,
Chartered Patent Agents, 53, Chancery Lane, London.

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